Discussion of

Deadly Embrace: Sovereign and Financial Balance Sheet Doom Loops

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Outline

Baseline: Maximal Dilution

- Output $E \sim F$ at $t = 2$
- Debt B_0 oustanding, due at $t = 2$
- Issue extra debt B_{NEW} at $t = 1$ to pay a dividend. $B_1 = B_0 + B_{NEW}$
- No default costs. If $B_1 > E$, output pro-rated among creditors
- Debt pricing:

$$p(B_1) = \frac{\mathbb{E}[\min\{E, B_1\}]}{B_1}$$

- Firm problem:

$$\max_{B_1} p(B_1)(B_1 - B_0) + \mathbb{E}[\min\{E - B_1, 0\}]$$

- Solution: maximal dilution ($B_1 = \infty$)

Debtor's Prison, Liquidity Needs and the Doom Loop

1. Debtor's prison
   - Utility cost Φ of default.
   - Firm problem:

$$\max_{B_1} p(B_1)(B_1 - B_0) + \mathbb{E}[\min\{E - B_1, 0\}] - \Phi F(B_1)$$

   - For Φ large enough, no dilution
2. Liquidity Needs
   - Firm needs to raise I
   - B_{NEW} solves:

$$p(B_1)(B_1 - B_0) = I \quad \Rightarrow \quad B_1 = \frac{I}{p(B_1)} + B_0$$

3. The doom loop (a fixed point problem):

$$p'(I) = -\frac{\left.\frac{1}{p\left(\frac{I}{p}+B_0\right)^2}\int_0^{\frac{I}{p}+B_0} E dF(E)\right\}\text{ higher liquidity needs}}{\left.1 - \frac{I}{p^2\left(\frac{I}{p}+B_0\right)^2}\int_0^{\frac{I}{p}+B_0} E dF(E)\right\}\text{ discount on new debt}}$$

Renegotiation?

- Will legacy creditors renegotiate?
  "Please write down your debts to $\tilde{B}_0 < B_0$ to reduce the risk that I'll default"
- Answer: no!
  1. If no dilution, payoff of legacy creditors:

$$\mathbb{E}\left[\min\left\{E, \tilde{B}_0\right\}\right]$$

  2. If
     - ⋆ liquidity need / dividend is I
     - ⋆ legacy creditors write down to $\tilde{B}_0$
     - ⋆ New debt issuance:

$$B_{NEW}\left(\tilde{B}_0\right) = \frac{I}{p\left(\tilde{B}_0 + B_{NEW}\left(\tilde{B}_0\right)\right)}$$

     - ⋆ Payoff of legacy creditors:

$$\frac{\tilde{B}_0}{\tilde{B}_0 + B_{NEW}}\mathbb{E}\left[\min\left\{E, \tilde{B}_0 + B_{NEW}\right\}\right]$$

- Either way, payoff increasing in $\tilde{B}_0$. No Laffer curve. No write down

Default Costs and Hold-Up

- Extreme case: default destroys all output
- Legacy creditors face Laffer curve:

$$\max_{\tilde{B}_0} \tilde{B}_0 \left[1 - F\left(\tilde{B}_0\right)\right]$$

  - Write down debt to peak of Laffer curve

- Firm announces dividend / liquidity need of I
  - New debt shifts peak of legacy Laffer curve:

$$\max_{\tilde{B}_0} \frac{\tilde{B}_0}{\tilde{B}_0 + B_{NEW}} \left[1 - F\left(\tilde{B}_0 + B_{NEW}\right)\right]$$

  - Dilution can be optimal (even without liquidity need)

Outline

A Sovereign and Banks

- Debt pricing:

$$p(s) = 1 - F(B_1|s)$$

  - Creditors do *not* share E upon default

- Liquidity is needed for bank bailout
  - (Setting $A = p_0 = 1$)

$$X(s) = I(s) - [r + (1-r)\,p(s)]$$

- Fixed point:

$$p(s) = 1 - F\left(\frac{I(s) - [r + (1-r)\,p(s)]}{p(s)} + B_0 \middle| s\right)$$

The Doom Loop Again

- Doom loop:

$$p'(s) = -\frac{\overbrace{\frac{\partial F(\cdot|s)}{\partial s}}^{\text{(1) lower fiscal surplus}} + \overbrace{f(\cdot|s)\frac{l'(s)}{p}}^{\text{(2) higher liquidity needs}}}{1 - \underbrace{f(\cdot|s)\frac{1-r}{p(s)}}_{\text{(3)public debt in bank portfolio}} \underbrace{- f(\cdot|s)\frac{l(s) - [r + (1-r)p(s)]}{p^2}}_{\text{(4) discount on new debt}}}$$

- Helps organize stories:
  - Argentina, Italy: (1) + (3) + (4)
  - East Asia, Ireland: (2) + (4)
  - etc.

Loose Regulation as Hold-Up

- Lower r requirement for banks
- Need bigger bailouts
- Will need greater debt issuance
- Legacy creditors will choose to forgive debt

Outline

Some Ideas

- Do Sovereigns need banks as an excuse to dilute their creditors?
  - Credibility of threat of dilution
  - Example of Greece
  - Role of politics?
- What are the default costs? Does debt forgiveness avoid them?
  - Blowing up banks
  - Reputation - role of coordination in punishment trigger
  - How about contingent claims?
- Role of timing of debt forgiveness.
  - Why not wait and forgive later?